

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-73 (canceled).

74. (Currently amended) A multilayer pipe having a non-contoured inner surface and a non-contoured outer surface, a stabilised inner layer of a thermoplastic polymer, and a contoured, seamless metallic barrier layer deposited thereon, wherein the metallic layer is from 0.01 μm to 10 μm in thickness, wherein the metallic layer is disposed between the thermoplastic inner layer and one or more outer polymeric layers, wherein the inner layer comprises an extruded thermoplastic polymer comprising at least one polar stabilizer, and wherein the thermoplastic polymer is selected from the group consisting of:

- (i) a thermoplastic polymer provided with pendant polar functional groups,
- (ii) a thermoplastic polymer comprising an amount of at least one filler provided with pendant polar functional groups, wherein the amount of at least one filler is sufficient to reduce the delamination of the inner layer from the barrier layer, or sufficient to reduce the leaching of the stabilizer from the polymer layer, or both, and
- (iii) a thermoplastic polymer comprises a blend of a non-polar thermoplastic polymer and a thermoplastic polymer provided with pendant polar functional groups.

Claim 75 (canceled).

76. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the thermoplastic polymer of the inner layer comprises a polyolefin.

77. (Previously presented) A multilayer pipe according to claim 76, wherein the polyolefin is selected from the group consisting of polyethylene, cross-linked polyethylene and polypropylene.

78. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the thermoplastic polymer of the inner layer comprises a polar functional polyolefin provided with polar functional groups.

79. (Previously presented) A multilayer pipe according to claim 78, wherein the thermoplastic polymer of the inner layer comprises a polar functional polyolefin produced by grafting of a moiety selected from polar functional groups and monomers onto a polyolefin backbone.

80. (Previously presented) A multilayer pipe according to claim 79, wherein the polar functional polyolefin polymer is a polar functional polyethylene.

81. (Previously presented) A multilayer pipe according to claim 80, wherein the polar functional polyethylene is ethylene/glycidyl methacrylate graft copolymer.

Claims 82-84 (canceled).

85. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the outer metallic barrier layer comprises a metal selected from the group consisting of aluminium, stainless steel and copper.

86. (Previously presented) A multilayer pipe according to claim 85, wherein the metallic layer is formed by a method selected from the group consisting of sputtering, spraying, plasma coating, galvanically-coating and electro-deposition.

87. (Previously presented) A multilayer pipe according to claim 86, wherein the outer barrier layer is directly bonded to the inner thermoplastic polymer layer.

88. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the thickness of the deposited metallic barrier is such that the metallic layer acts as a barrier to limit oxygen and water vapour diffusion into the inner thermoplastic polymer layer and also impedes diffusion of stabilisers and other additives out from the inner thermoplastic polymer layer.

Claim 89 (canceled).

90. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the metallic layer is from 0.05 μm to 5 μm in thickness.

91. (Currently amended) A multilayer pipe according to claim ~~73~~ 74, wherein the shape of the deposited metallic barrier layer and the outer surface of the inner layer is selected from the group consisting of helically convoluted, circumferentially convoluted, corrugated, ribbed, and patterned such that their surfaces vary in cross-section along the length of the pipe in a regular fashion.

92. (Previously presented) A multilayer pipe according to claim 91, wherein the contoured surfaces of the deposited metallic barrier layer and the outer surface of the inner layer are formed with sinusoidal corrugations.

Claims 93 and 94 (canceled).

95. (Previously presented) A multilayer pipe according to claim 74 wherein the polar stabiliser is selected from the group consisting of a phenolic antioxidant, a phosphite, a phosphonite, a benzotriazole and a sterically-hindered amine.

96. (Previously presented) A multilayer pipe according to claim 74 wherein the stabiliser is present in the inner polymeric layer in an amount of from 0.01 to 5 weight percent, based on the weight of the inner polymeric layer.

97. (Previously presented) A multilayer pipe according to claim 74 wherein the filler is inorganic-based filler.

98. (Previously presented) A multilayer pipe according to claim 74 wherein the inorganic-based filler is selected from the group consisting of talc, mica, calcium carbonate, kaolin, clay, magnesium hydroxide, calcium silicate, carbon black, graphite, iron powder, silica, diatomite, titanium oxide, iron oxide, pumice, antimony oxide, dolomite, dawsonite, zeolitic filler, vermiculite, montmorillonite and hydrated alumina.

99. (Previously presented) A multilayer pipe according to claim 74 wherein the inorganic-based filler has a mean particle diameter of up to 10 μm .

100. (Previously presented) A multilayer pipe according to claim 74 wherein the inorganic-based filler(s) content of the inner polymeric layer is from 0.5 to 25 weight percent, based on the weight of the polymeric matrix.

101. (Previously presented) A multilayer pipe according to claim 74 wherein the filler is selected from the group consisting of filler having pendant functional polar groups on its surface and filler that has been treated to produce such surface functional groups.

102. (Previously presented) A multilayer pipe according to claim 74 wherein the filler comprises a component selected from the group consisting of talc, mica, calcium carbonate, hydrated alumina and titanium dioxide.

103. (Previously presented) A multilayer pipe according to claim 74 wherein the filler is a nanofiller.

104. (Previously presented) A multilayer pipe according to claim 103, wherein the nanofiller is present in an amount of from 1% to 5% by volume, based on the volume of the inner polymeric layer.

105. (Previously presented) A multilayer pipe according to claim 104, wherein the particles of the nanofiller are uniformly dispersed in the inner polymeric layer.

106. (Previously presented) A multilayer pipe according to claim 74 wherein an adhesive layer is disposed between the inner polymeric layer and the contoured deposited metallic barrier layer.

107. (Previously presented) A multilayer pipe according to claim 106, wherein the adhesive layer comprises a polymer comprising one or more functional groups selected from the group consisting of carboxyl, carboxylic, anhydride, epoxy, hydroxyl, isocyanate, aldehyde ester, acid amide, amino, hydrolysable silyl and cyano.

108. (Currently amended) A multilayer pipe according to claim ~~75~~ 74, wherein the additional outer polymeric layer comprises cross-linked polyethylene.

Claims 109-126 (canceled).

127. (Currently amended) A multilayer pipe according to claim 74 ~~further~~ comprising an outer layer, wherein the compressive E-modulus of the inner layer is lower than the compressive E-modulus of the outer layer.